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SERU Project and Consortium Research Paper*

WEALTH, COST, AND THE UNDERGRADUATE STUDENT EXPERIENCE AT LARGE PUBLIC RESEARCH UNIVERSITIES

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ABSTRACT

Relying primarily on the responses of a proportionally weighted sample of undergraduate students attending eighteen major public research universities (N > 300K, responses from > 130K, n > 40K) that are part of the Student Experience in the Research University Consortium, this paper concludes that students from households at all income levels have been impacted by the increasing expense of higher education. The large majority of students from households at all income levels have changed behaviors to make college more affordable. However, the most remarkable result was that dependent students from households with incomes up to $100,000 experienced college much the same. Thus far, it appears that financial aid has been very successful at mitigating the challenges of limited or inadequate household financial resources – generally households with incomes less than $100,000. In contrast, students from wealthier households, that is households with income greater than $200,000, have a more satisfied, more enriching educational experience and worry about financial debt less. As is generally true, it is better to be wealthy. The perception of value for price paid varied by state and was not directly associated with cost to attend or by selectivity, except that the top-rated public universities were considered to be good values regardless of relative cost. And last, there was no clear evidence of middle-class squeeze in the experience of undergraduate students. There were no behaviors or satisfaction ratings with U-shaped relationships where poor and wealthy students had better experiences than students from households in the middle ranges. The relationships were linear or curvilinear with monotonic increases. Note that the lack of middle-class squeeze was based on currently enrolled students' experiences, not the experiences of their parents, students who did not enroll or enrolled elsewhere, or of recent graduates. One question is whether we will see similar findings over time, and as public universities increase their tuition and financial aid programs.

Events of the recent past have exacerbated the declining higher education support of the last few decades. The financial future of higher education generally, and more specifically, the future of the University of California looks worse today than at any time in the past thirty or more years. Higher education is not the opportunity that it was when the parents of current students matriculated.

There is no indication that the retired generation, the currently retiring generation, or the generation facing retirement will step forward to provide for subsequent generations the opportunities they had. Without question, the University of California in 2011 is not the affordable, accessible institution that it has been historically. UC in 2011 is certainly more exclusive and more prestigious. Unfortunately, it is also much more expensive and the expense is expected to be borne by students and their families and to be repaid in future earnings.

* Steve Chatman is the SERU-AAU Consortium Director. SERU is a collaborative of major research universities based at the Center for Studies in Higher Education at UC Berkeley and including the administration of the SERU survey of undergraduates at 18 major US universities. The 2010 administration included all nine UC campuses with undergraduate programs and several of the other top 25 public national universities: Rutgers University, the University of Pittsburgh, the University of Michigan, the University of Minnesota, the University of Oregon, the University of Texas, and in limited cases, the 2011 administration for University of Florida. For more information, see the SERU website at: http://cshe.berkeley.edu/research/seru/

When considering inflationary effects, it can be helpful to differentiate cost over time and changes in the product over time. For example, an automobile and a college degree share cost characteristics. A base Chevrolet Camaro in 2010 cost $22,995. The base Camaro in 1970 cost $2,749 ($15,450 in 2010 dollars). As is true for the cost of a college degree, the cost of a Camaro has increased far more than inflation but what about the product itself?

The 2010 Camaro has many characteristics that the 1970 Camaro did not have: four-wheel disk brakes, stability control, air bags (head curtain, thorax, and six standard), Bluetooth, USB, OnStar, XM Satellite Radio, fuel injection, crumple zones, catalytic converter, standard HVAC. None of these were standard on the 1970 Camaro and many were not available. The 2010 Camaro also delivers about 24 MPG combined and its V6 produces 304 HP. The 1970 Camaro got about 13 MPG combined and produced 155 HP. The 2010 Camaro will provide better, safer performance for well over 100,000 miles and is the product of a very different design and production assembly line processes.

While it is a crass comparison, how different are the means of production and the resulting college graduate in 2010? Before tuition is dramatically increased again, maybe it is time to consider making changes in instructional delivery. Instead of *pro forma* reluctance to increase the cost to attend before doing so, public higher education should explicitly consider the impact of personal financial resources on the undergraduate experience and especially on the middle- and upper-class families that have provided the majority of the University's revenue for instruction over time.

As discussed in the following narrative, student responses to a comprehensive survey at eighteen major public research universities (all nine University of California undergraduate campuses and nine non-UC AAU campuses) in 2010 provides insights useful for policymakers, including:

- The public higher education experience was different for children from wealthier homes but the relationship between income and educational experience was not linear. Overall, financial aid has ameliorated the differences in experience for children from families with annual incomes below about $100,000. In that respect, financial aid programs have been remarkably successful.
- Nearly all students have been impacted by increased cost of attendance and have changed behaviors.
- The educational experience of students from families with higher incomes, and especially incomes above $200,000, was better. They were more satisfied, were more likely to participate in enriching activities, and were less likely to worry about family or personal debt.
- The perception of value of education for price paid varied by state and the University of California campuses were rated **lower** than most non-UC AAU institutions[i].
- There was variation in rating of value of education within the University of California, but the campuses were not arrayed by admissions selectivity.

Hence, among these institutions, there was no clear evidence of middle-class squeeze in the experience of undergraduate students. There were no behaviors or satisfaction ratings with U-shaped relationships where poor and wealthy students had better experiences than students from households in the middle ranges. The relationships were linear or curvilinear with monotonic increases. Note that the lack of middle-class squeeze was based on currently enrolled students' experiences, not the experiences of their parents, students who did not enroll or enrolled elsewhere, or of recent graduates. One question is whether we will see similar findings over time, and as public universities increase their tuition and financial aid programs.

The Middle-Class Squeeze

In a national context, here are a few observations about the changing circumstances of middle-class families that might be helpful. The first two come from Joe Biden's 2010 Task Force on the Middle Class:[ii]

- From 1990 to 2008, the same two-parent, two-child family experienced a 20% increase in income. Unfortunately for college access and affordability, cost of attendance at a four-year public college (i.e., tuition, educational fees, room and board) has increased 60%.
- Expressed in a longer timeframe, tuition from 1979-80 to 2007-2008 for public four-year colleges, in inflation adjusted dollars (2008), has increased on average from $2,174 to $7,020.

Or perhaps more directly summarized by Elizabeth Warren[iii],

> When we compare middle class families today with their parents a generation ago, we have basically flat earnings -- a fully employed male today earns on average about $800 less, adjusted for inflation, than a fully employed male earned a generation ago. The only way that families could increase their household income was to put a second earner into the workforce, and, of course that's now flattened out because there aren't any more people to put into the workforce. So you've got, effectively, flat income in this time period, with rising core expenses: housing; health insurance; child care; transportation, now that it takes two cars to get everywhere, two jobs to support; and taxes . . . families are spending a lot more on what you describe as the basic nut. (Washington Post, Voices of Power).

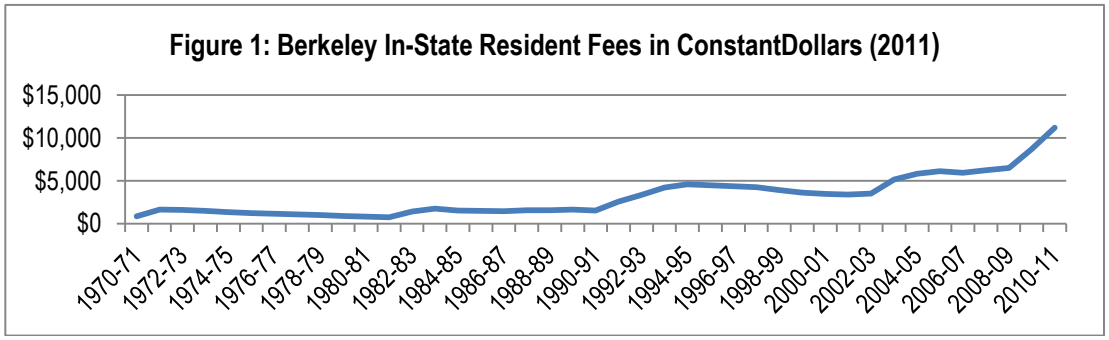
And again from Elizabeth Warren in *Harvard Magazine* (March-April, 2011), The Middle Class on the Precipice, when comparing a single earner family in 1970 to a two earner family in 2004,

> As noted earlier, although a man is making nearly $800 less than his counterpart a generation ago, his wife's paycheck brings the family to a combined income that is $73,770—a 75 percent increase. But higher expenses have more than eroded that apparent financial advantage. Their annual mortgage payments are more than $10,500. If they have a child in elementary school who goes to daycare after school and in the summers, the family will spend $5,660. If their second child is a pre-schooler, the cost is even higher—$6,920 a year. With both people in the workforce, the family spends more than $8,000 a year on its two vehicles. Health insurance costs the family $1,970, and taxes now take 30 percent of its money. The bottom line: today's median-earning, median-spending middle-class family sends two people into the workforce, but at the end of the day they have about $1,500 **less** for discretionary spending than their one-income counterparts of a generation ago.

In inflation adjusted dollars, middle-class discretionary income has declined, the cost of higher education has increased, state support for higher education has declined, and the importance to lifetime earnings for college graduates has increased. For higher education and matriculating students, it is a bad situation getting worse and it would be naive to think that these changes have left higher education untouched.

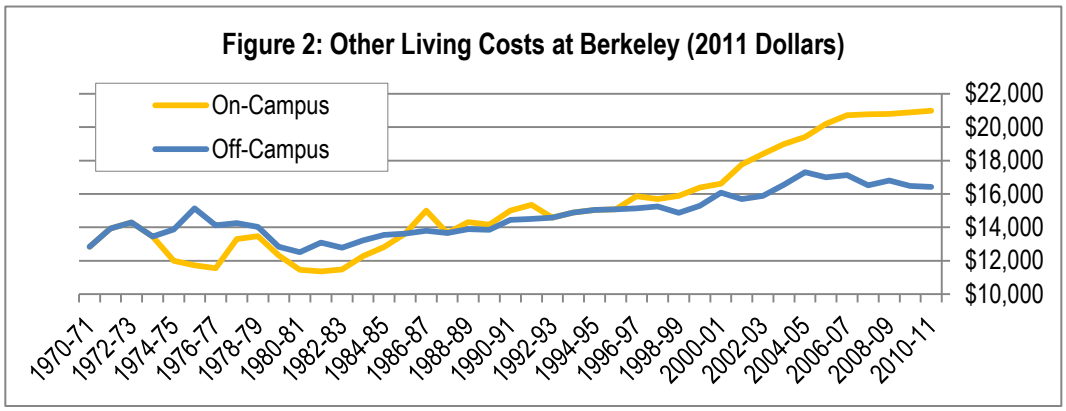
Closer to home for UC Berkeley, Figures 1 and 2 illustrate the historic and recently more rapid growing increases in educational fees and higher education costs. In the 1970s and 1980s, educational fees were nearly constant, and relatively much less expensive when adjusted for inflation, but that pattern changed in the 1990s. From 1990 to now, fees have increased as a step function with sharp increases followed by periods of no or little increase.

The plateaus have been shortening over time until there are hardly plateaus at all, just an inflation-adjusted climb increasing more and more rapidly. When the cost of higher education is mentioned in the press, educational fees and tuition increases have been the most public subject of concern, but the inflation adjusted residual amount of the cost to attend UC Berkeley has been increasing as well, especially for students living in university housing. The reason that the cost to live in a residence hall has outpaced inflation is not obvious.



As shown, if costs had remained the same as in 1970, adjusted for inflation, attendance as a freshman living in the residence halls at Berkeley would have cost about $14,000 less in 2010-11. Imagine that the $14,000 less per year was in real dollars and that the difference for the parents was retiring a year earlier, taking family trips to Hawaii and Italy, buying a new basic Toyota Corolla each year, or other big changes in standard of living each year for about four years.

There is reason to be concerned about the increasing financial pressures placed on students and their families, especially those families with earnings too high to qualify for grants but not high enough to pay for college without loans – much of the middle class – and the problem is exacerbated by the income changes over time described earlier for the nation. It is not as if these families were going to otherwise travel to Hawaii and Italy or buy a new Corolla each year – those examples were used to illustrate how much more expensive college is now even when adjusted for inflation. There is good reason to be concerned about middle-class squeeze and this study will examine that possibility and other possible effects of financial impact from the students' perspective including higher education expense, value, debt, and impact on educational experience.



The Study

The 2010 administration of SERU/UCUES[iv] presented a unique opportunity to examine the impact of personal financial resources on the higher education experiences of students at large public research universities. The 2010 administration included all nine UC campuses with undergraduate programs and several of the other top 25 public national universities: Rutgers University, the University of Pittsburgh, the University of Michigan, the University of Minnesota, the University of Oregon, the University of Texas, and in limited cases, the 2011 administration for University of Florida.

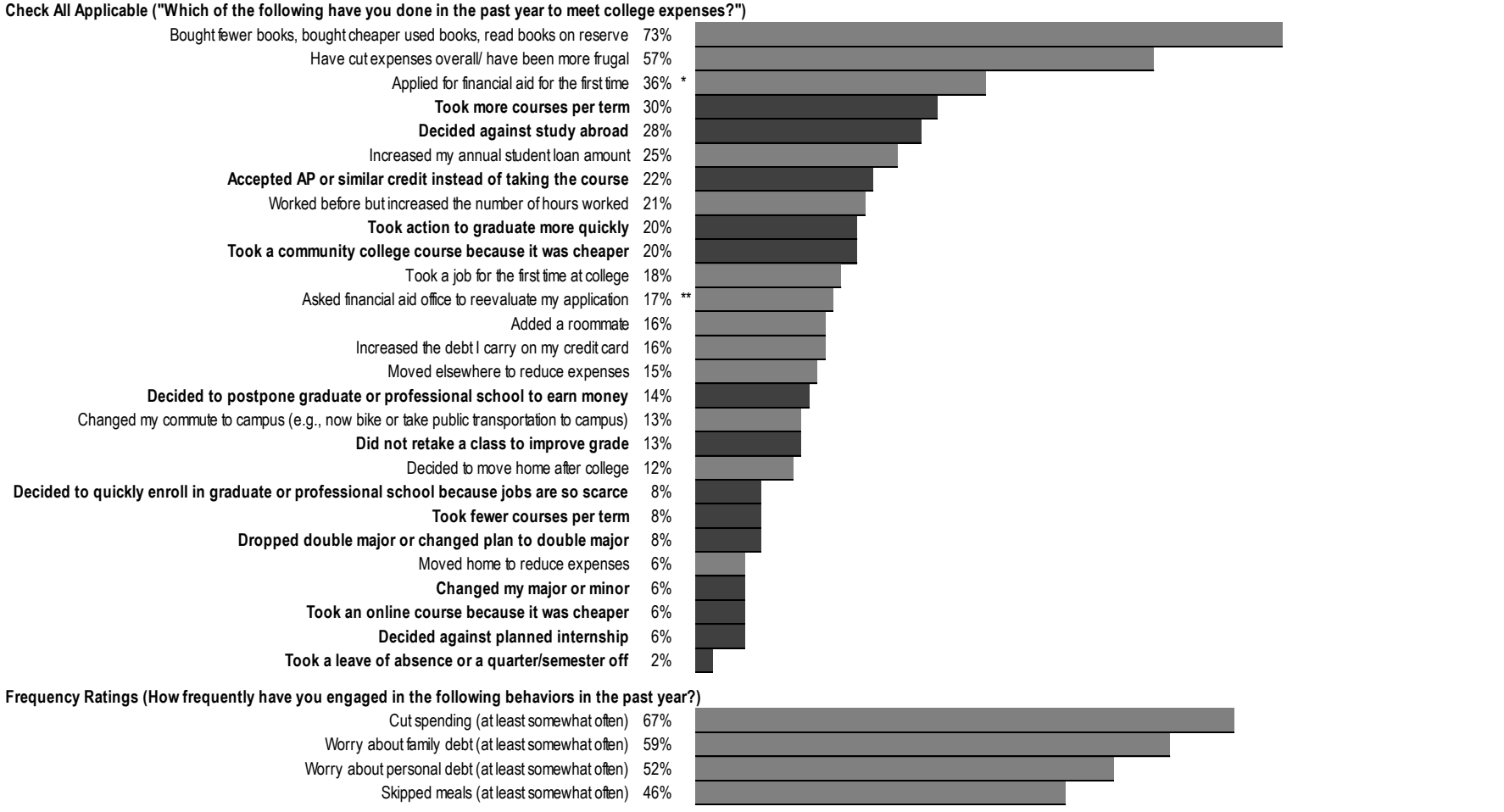
In response to concern about the impact of rising costs and declining financial resources, the SERU/UCUES Consortium institutions elected in 2009 to include items designed to collect information about discretionary student behaviors that were likely sensitive to cost and affordability on the 2010 questionnaire. The items ranged from book purchases, to roommate and living choices (e.g., carry more debt on credit cards, increase work hours), to academic decisions (e.g., take more courses to graduate more quickly, drop plan to double major or study abroad). Students could select all items that applied to them and the following results were based on the responses by a sample weighted by campus enrollment to reflect the 2010 SERU/UCUES population.[v]

The most prominent result was that the majority of students had taken at least one action to reduce costs. The majority of students had bought fewer new books, bought more used books or had used reserved books, and had cut expenses overall. Whether these behaviors would yield a negative impact or not is unclear. The nonprofit consumer advocacy group, U.S. Public Interest Research Group, reported that 70% of students decided against purchasing a text book because it was too expensive. They reported that 78% of those not purchasing the text believed that they would perform more poorly.[vi] In spite of the convenience sampling interview technique employed by their clipboard carrying volunteers, the result was very similar to the 73% rate reported here using more rigorous standards.

This study also found students engaging in many other behaviors to reduce costs that clearly impacted students' academic experiences. The most common were: took more courses per term (30%), decided against study abroad (28%), accepted AP credit (22%), and took action to graduate more quickly (20%). Several other behaviors might not impact the academic experience of students but do clearly impact institutions and especially service delivery.

The most common of these were to apply for financial aid for the first time (36%), decide against study abroad (28%), and accept credit by examination instead of taking the course (22%). Among those personal behaviors listed were several about which institutions should be concerned: increased annual loan amount (25%), increased the debt carried on credit cards (16%); and regularly worried about family debt (59%), regularly worried about personal debt (52%), and skipped meals (46%).

Table 1: Behaviors in Response to the Economic Challenge of Attending College



Weighted random sample of financially dependent 2010 SERU respondents.

* If analysis is limited to upper-division students because new students would apply for aid for the first time in any event, 29% of juniors and 22% of seniors applied for the first time.

** Over class level, the percentage was reasonably flat (16% for freshmen, 17% for sophomores and juniors and 13% for seniors.

Items in bold are directly related to throughput -- time to degree

Darker shaded items are clearly academic.

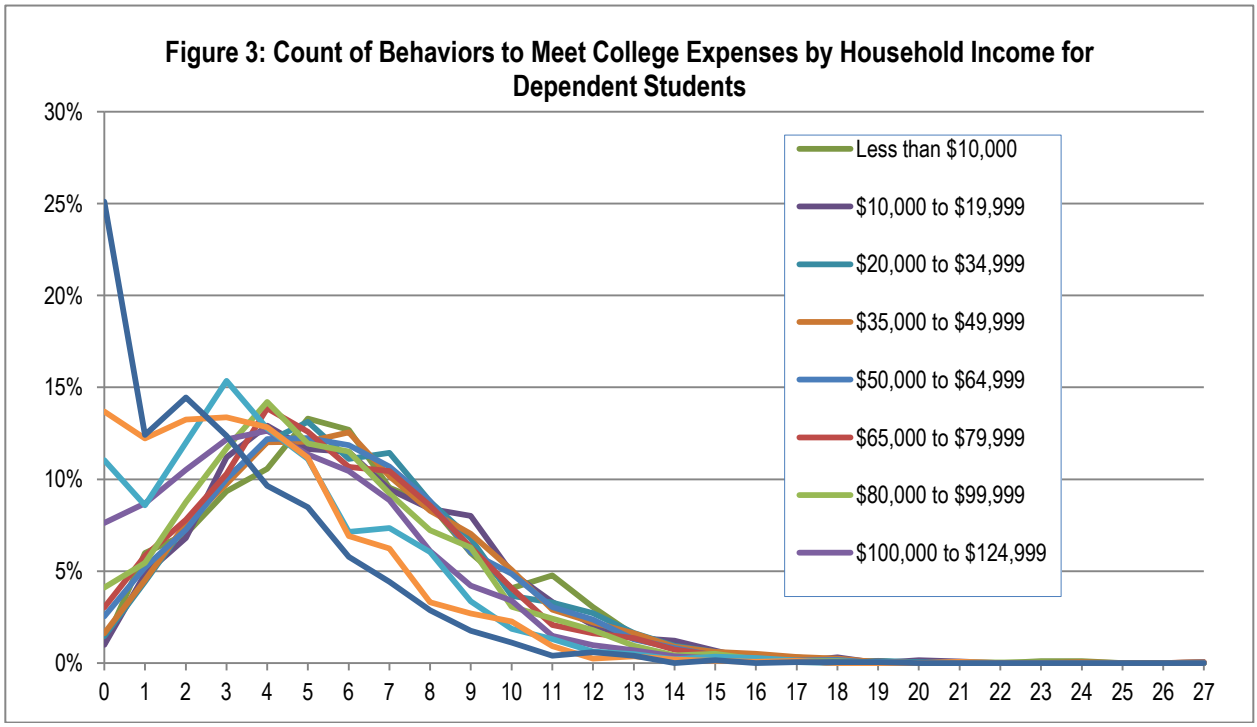


Figure 3: Count of Behaviors to Meet College Expenses by Household Income for Dependent Students
30%
25%
20%
15%
10%
5%
0%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Less than $10,000
$10,000 to $19,999
$20,000 to $34,999
$35,000 to $49,999
$50,000 to $64,999
$65,000 to $79,999
$80,000 to $99,999
$100,000 to $124,999

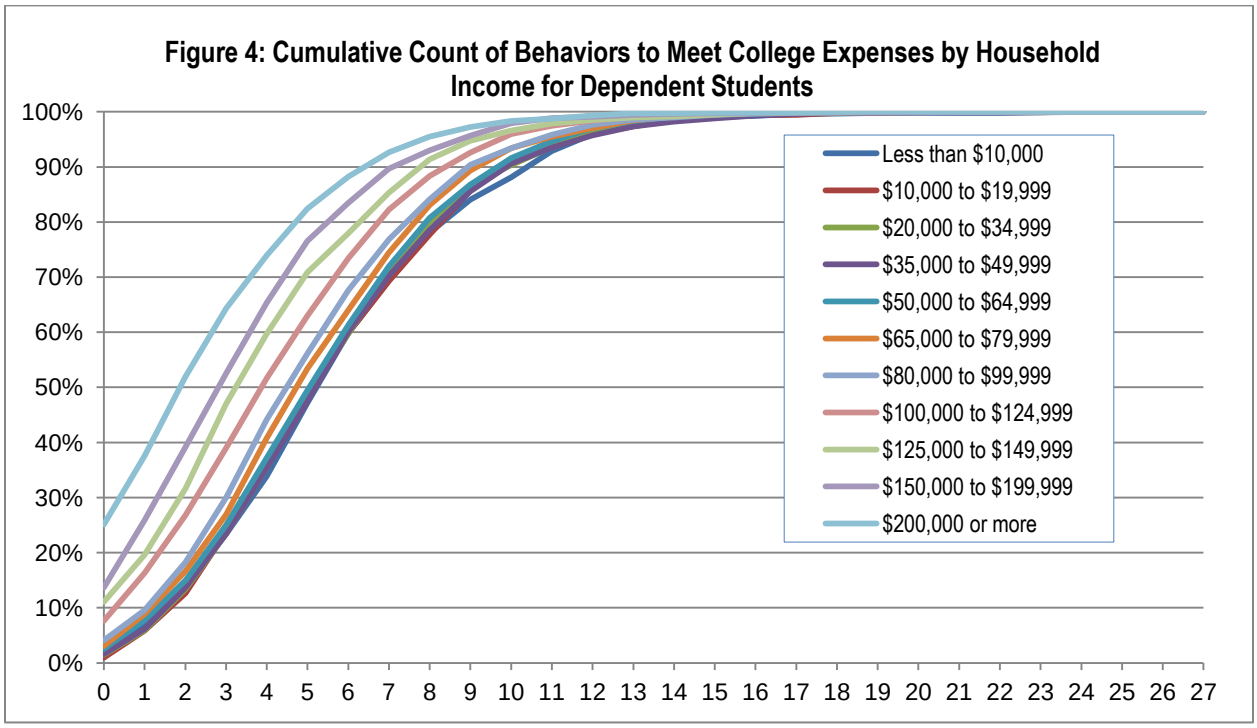


Figure 4: Cumulative Count of Behaviors to Meet College Expenses by Household Income for Dependent Students
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Less than $10,000
$10,000 to $19,999
$20,000 to $34,999
$35,000 to $49,999
$50,000 to $64,999
$65,000 to $79,999
$80,000 to $99,999
$100,000 to $124,999
$125,000 to $149,999
$150,000 to $199,999
$200,000 or more

Table 2: Behaviors to Meet College Expenses by Household Income

Home Income	Mean Behavior Count
Less than $10,000	6.1
$10,000 to $19,999	6.0
$20,000 to $34,999	6.0
$35,000 to $49,999	6.1
$50,000 to $64,999	5.8
$65,000 to $79,999	5.6
$80,000 to $99,999	5.4
$100,000 to $124,999	4.7
$125,000 to $149,999	4.2
$150,000 to $199,999	3.7
$200,000 or more	3.0
Overall	5.1

Dependent Students

Source: SERU/UCUES 2010 (UC Berkeley)

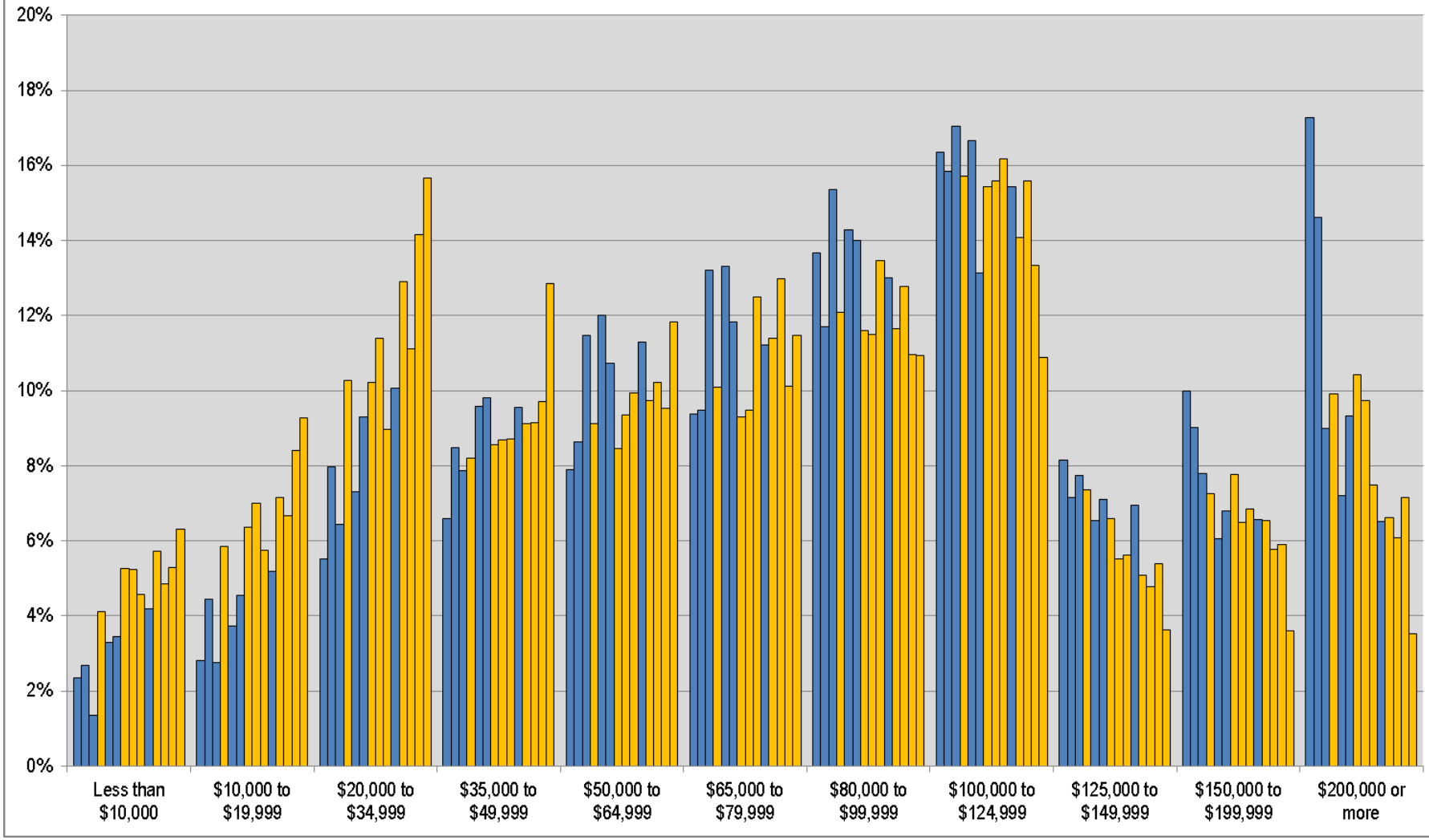
Results to this point have established that cost-saving behaviors to afford college were common and related to household income for dependent students. It has also been established that the financial support being provided to students has done much to ameliorate the impact of resources for students from households with less than $100,000 in annual income. The next analysis examined income distribution by institution and these observations used the original data, not the weighted sample, and were restricted to financially dependent students.

Arrayed from highest to lowest mean income, there were several clearly supported observations to be made about the distribution of students by household income:

- Overall, non-UC AAU institutions had more students from wealthier households than did the UC campuses. Of the top six campuses by income, five were non-UC AAU and seven of the lowest eight were UC. At the campus with the wealthiest student body, about 17% of students were from households with incomes over $200,000. At the campus with the poorest student body, only 4% of students were from households in that interval.
- There was a distribution anomaly, especially among UC campuses, of a spike in the $20,000 to $35,000 interval. For most campuses, the modal interval (most frequent) interval was $100,000 to $125,000.

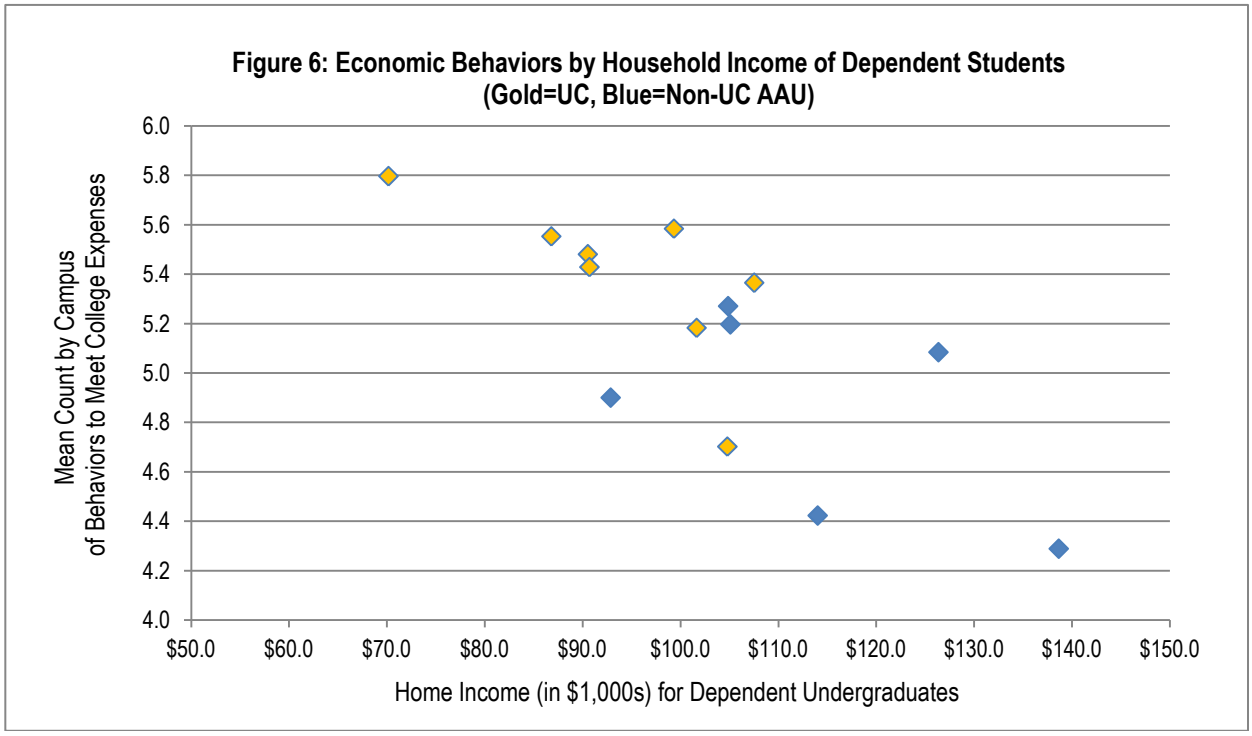
Figure 5: Household Income Distribution by Campus Sorted by Mean Income

(UC Campuses in Gold, Non-AAU Campuses in Blue)



The next analyses used the weighted sample of dependent students to reflect undergraduates in higher education more broadly. Given that behaviors to afford college varied by household income and that household income varied by campus, it was reasonable to assume that mean behaviors would vary by campus. That finding and the overall association of income and behavior are displayed in Figure 6.

There was a clear negative correlation with mean number of behaviors decreasing as mean income increased even though the variation of mean behaviors was apparently less than the variation in mean household income. In other words, the average number of behaviors varied a relatively small amount, from 5.8 to about 4.3, while the mean income varied a much larger amount, from about $70,000 to nearly $140,000. Again, the lack of variance by campus, in spite of income differences, was most likely due to the ameliorating impact of financial aid. The student bodies of the University of California campuses may be comprised of a larger percentage of less wealthy students due to admissions practices that advantage students doing well in challenging circumstances and UC system and California state financial aid policies.



Mean household income and economically related behavior counts are displayed in Table 4 arrayed by common demographic variables and for global ratings of satisfaction. The relationships between behavior counts and income were clear in most cases:

- Males reported fewer cost saving behaviors and higher household incomes than females.
- White students had higher incomes and exhibited fewer cost-saving behaviors than Asians. Asians had higher incomes and exhibited fewer behaviors than African-American, Hispanic and Chicano students.
- Satisfaction with value of education for price paid was higher for higher income students who inversely reported fewer cost saving behaviors.
- Not expected were the facts that the other global satisfaction measures were also positively associated with household income and negatively associated with cost saving behaviors. For example, students who were very satisfied with their overall academic experience were from households with a mean income nearly $30,000 higher than those very dissatisfied. Inversely, very satisfied students exhibited only 4.7 behaviors in contrast to the 6.5 reported by very dissatisfied students. The same pattern and nearly the same values were reported for satisfaction with overall social experience and sense of belonging.

Table 4: Economic Related Behaviors and Household Income of Dependent Undergraduates at SERU Universities by Demographics

	Mean Income in $1,000s	Behavior Counts		Mean Income in $1,000s	Behavior Counts
Gender			**Satisfaction with overall social experience**		
Male	106.8	4.7	Very dissatisfied	87.6	6.3
Female	98.7	5.4	Dissatisfied	92.6	5.7
Class level			Somewhat dissatisfied	88.5	5.5
Freshman	93.2	4.6	Somewhat satisfied	95.2	5.2
Sophomore	101.3	5.0	Satisfied	104.8	4.9
Junior	100.4	5.3	Very satisfied	119.1	4.8
Senior	106.4	5.2	**Agreement with sense of belonging**		
Ethnic			Strongly disagree	89.7	6.5
Chicano	65.6	6.1	Disagree	90.7	5.9
African-American	70.4	5.6	Disagree somewhat	88.0	5.7
Asian	85.0	5.1	Agree somewhat	92.0	5.3
White	124.5	4.9	Agree	103.1	5.0
Value of education for price paid			Strongly agree	115.9	4.8
Very dissatisfied	85.2	6.9	**Home Income**	Frequency	
Dissatisfied	90.5	6.1	Less than $10,000	3,482	5.7
Somewhat dissatisfied	91.3	5.7	$10,000 to $19,999	4,711	5.9
Somewhat satisfied	98.0	5.1	$20,000 to $34,999	8,254	5.8
Satisfied	109.0	4.5	$35,000 to $49,999	7,208	5.8
Very satisfied	127.6	4.1	$50,000 to $64,999	7,928	5.7
Satisfaction with overall academic experience			$65,000 to $79,999	8,797	5.6
Very dissatisfied	85.6	6.5	$80,000 to $99,999	9,905	5.3
Dissatisfied	89.1	5.9	$100,000 to $124,999	11,932	4.6
Somewhat dissatisfied	90.5	5.7	$125,000 to $149,999	4,841	4.2
Somewhat satisfied	94.3	5.3	$150,000 to $199,999	5,315	3.8
Satisfied	107.0	4.9	$200,000 or more	6,667	2.9
Very satisfied	117.4	4.7			

The next analytical step was to examine how frequently household income and other demographic variables were associated with student experience. Looking at income first, of the nearly 600 elements of information collected by the SERU/UCUES questionnaire, there were only 50 that had even a weak to moderate association with household income[vii] for these financially dependent students. Those associated variables were arrayed from strong to weak in Table 5. At the top of the list were eight items with very strong associations. Stated as a positive association, those eight were:

1. Higher self-reported SES while growing up associated with higher household income (redundant information)
2. Father born in the U.S. associated with higher income
3. Mother born in the U.S. associated with higher income
4. Higher income more likely to report that cost of attendance has not been a problem
5. Father's mother born in the U.S. associated with higher income
6. Father's father born in the U.S. associated with higher income
7. Mother's father born in the U.S. associated with higher income
8. Mother's mother born in the U.S. associated with higher income

Table 5: Variables Associated with Household Income for Dependent Undergraduates (Weighted Sample)

Strength of Relationship	1st Generation U.S.	Economic Behaviors	Cramer's V	Direction of Relationship	Abbreviated Description
Very Strong			0.39	Upper higher	Which of the following best describes your social class when you were growing up?
Very Strong	Yes		0.31	Born outside US lower	Father born in/outside US
Very Strong	Yes		0.29	Born outside US lower	Mother born in/outside US
Very Strong			0.29	No cost effect higher	None of the above. Cost hasn't been a problem
Very Strong	Yes		0.28	Born outside US lower	Father's mother born in/outside US
Very Strong	Yes		0.28	Born outside US lower	Father's father born in/outside US
Very Strong	Yes		0.27	Born outside US lower	Mother's father born in/outside US
Very Strong	Yes		0.27	Born outside US lower	Mother's mother born in/outside US
Strong			0.24	Traveled higher	Traveled abroad for recreation (doing or have done)
Strong		Yes	0.23	Lower income more likely	Increased my annual student loan amount
Strong		Yes	0.21	Lower income more likely	Applied for financial aid for the first time
Strong			0.20	Lower income more concerned	How concerned are you about your accumulated educational debt?
Strong			0.19	Lower income more concerned	How concerned HAVE YOU BEEN about paying for your undergraduate education up to now?
Strong		Yes	0.19	Lower income more likely	Bought fewer books, bought cheaper used books, read books on reserve
Strong			0.18	Lower income more concerned	How concerned are you about paying for your undergraduate education NEXT YEAR?
Strong			0.18	Lower income more concerned	How concerned HAVE YOU BEEN about paying for your undergraduate education up to now?
Strong			0.18	Lower income more concerned	Worried about my family's debt and financial circumstances (frequency)
Strong	Yes		0.18	Native speaker have higher income	When did you learn to speak English?
Strong		Yes	0.18	Lower income more likely	Asked financial aid office to reevaluate my application
Strong			0.18	Higher income higher hours	What was the average number of total service hours for the service-learning courses you took?
Strong			0.17	Higher income higher degree	Highest level of education by father
Strong	Yes		0.16	Higher income higher degree	Highest level of education by mother earned in US
Strong		Yes	0.16	Lower income more likely	Have cut expenses overall/have been more frugal
Strong			0.15	Higher income less concern	Worried about my personal debt (frequency)
Strong			0.15	Strong higher	Do you consider yourself to be a strong Republican?
Strong	Yes		0.15	Higher income higher degree	Highest level of education by mother earned in US
Strong		Yes	0.15	Lower income more likely	Cut down on personal / recreational spending (in last year)
Moderate			0.14	Higher income higher degree	Highest level of education by mother
Moderate			0.14	Higher income higher agreement	Agreement that students of my socio-economic status are respected on this campus
Moderate			0.14	Higher income more grandparents	To the best of your knowledge, how many of your grandparents went to college?
Moderate		Yes	0.14	Lower income more likely	Increased the debt I carry on my credit card
Moderate			0.14	Lower income more obstacle	Weak English skills (obstacles)
Moderate			0.13	Higher income more likely	Through my fraternity or sorority (how got involved in community service)
Moderate		Yes	0.13	Lower income more likely	Decided against study abroad
Moderate			0.13	Lower income more obstacle	Competing family responsibilities (obstacles)
Moderate		Yes	0.12	Lower income more likely	Worked before but increased the number of hours worked
Moderate	Yes		0.12	Higher income higher degree	Highest level of education by mother earned outside US
Moderate	Yes		0.12	Higher income higher degree	Highest level of education by mother earned outside US
Moderate	Yes		0.12	Higher income higher agreement	Agreement that students of my immigration background are respected on this campus
Moderate		Yes	0.12	Lower income more behaviors	Count of economic related behaviors
Moderate			0.11	Higher income higher agreement	Agreement that students of my race/ethnicity are respected on this campus
Moderate			0.11	Higher income more affordable	Affordable to Not affordable scale
Weak/Moderate		Yes	0.10	Lower income more likely	Moved elsewhere to reduce expenses
Weak/Moderate		Yes	0.10	Lower income more likely	Did not retake a class to improve grade
Weak/Moderate			0.10	Higher income more likely	Other internship (e.g., co-op, clinical assignment)
Weak/Moderate			0.10	Variety of outcomes	With which ONE of these groups do you MOST strongly identify?
Weak/Moderate		Yes	0.10	Lower income more likely	Changed my commute to campus (e.g., now bike or take public transportation to campus)
Weak/Moderate		Yes	0.10	Lower income more likely	Skipped meals to save money (frequency)
Weak/Moderate			0.10	Higher income less likely	Disaster relief or incident response (community service)
Weak/Moderate		Yes	0.10	Lower income more likely	Added a roommate

If Cramer's V = .25 or higher Very strong relationship

.15 to .25 Strong relationship

.11 to .15 Moderate relationship

.06 to .10 weak relationship

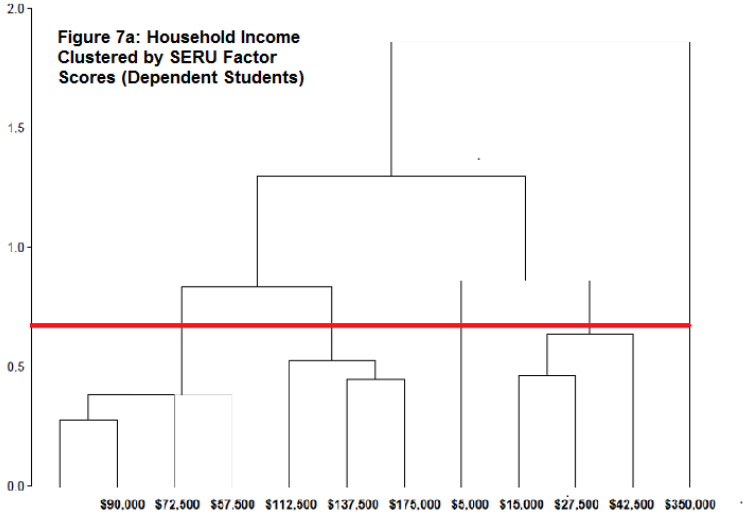
.01 to .05 No or negligible relationship

As these items and six others not listed here showed, immigrant status was very clearly and negatively associated with household income. The behavior items mentioned previously in this paper were also commonly associated with household income. However, more important than these and other expected relationships was the fact that there were exceedingly few associations overall, very few that affected the social experience of students, and even fewer that directly affected the academic

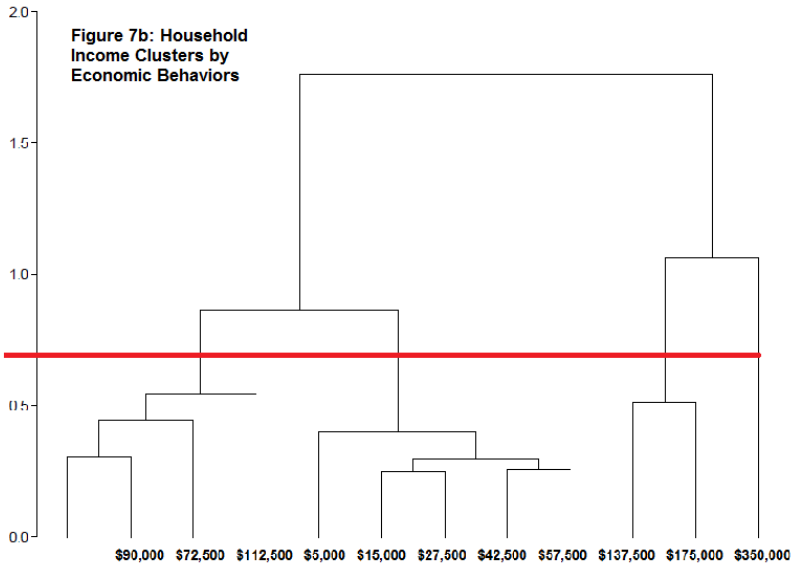
experience of students. It is remarkable that household income was so unimportant. On the academic side of student experience, only book purchases and enrichment activities were associated with household income (e.g., study abroad, internships, and service hours).

On the social student experience side, perception of campus climate and social experience was more often associated with household income. Specifically, the agreement ratings for "Students of my socio-economic status are respected on this campus," "Students of my immigration background are respected on this campus," and "Students of my race/ethnicity are respected on this campus" were associated with household income. The associations to this point were to responses to the 600+ individual items collected using the random module assignment technique employed by SERU/UCUES. Association to factor scores permits a more robust analysis because the examination is to clusters of items sharing latent constructs (e.g., satisfaction, student engagement).

Figures 7a and 7b display the results of cluster analysis where household income groups were clustered based on SERU/UCUES factor scores[viii], household income (7a), and economic behaviors (7b). Instead of the household income intervals as labels, these figures display the midpoints of the income intervals to save space. Factor scores were based on commonalities in the questions asked and effectively reduced over 130 core items to fewer than 40 scores (nine factor scores and about 30 subfactor scores). Using factor scores as the broadest measure of educational experience produced five clusters. The top income group was the most distinct, the lowest was the next most distinct, and in no case were income clusters out-of-order. In other words, the income clusters could be arranged in order from highest to lowest and the clusters would be formed contiguously by the purely mathematical procedure. Another dimension of student experience pertinent to this paper was cost saving behaviors. A cluster analysis of these behaviors is shown as Figure 7b.



Again, using a 0.7 centroid distance identified four contiguous clusters with no income interval out of order. The most distinct category was again household incomes greater than $200,000. Note that this cluster analysis of cost saving behaviors used the individual behaviors instead of the sum of behaviors. That difference between count of behaviors and the behaviors themselves explained why the previously observed clear distinction between behavior counts above and below $100,000 was somewhat different. The 7b tree diagram showed the larger distinction to be at the next household interval beginning at $120,000.



The "importance" of several demographic and academic variables was examined more completely in Tables 6 and 7. Table 6 assumed that satisfaction with value of education received for price paid was the most critical or important measurement when examining cost of attendance and educational experience because it was based on students' summary personal judgment. Using analysis of variance with each variable treated independently found that gender, class level, and area of major were not associated with rating of value of education for students overall.

Two variables had weak explanatory power (2% variance explained): race/ethnicity and household income. Using *post hoc* tests of pairwise comparisons and a modest amount of judgment based on frequency of differences, produced three groupings for race/ethnicity and three for household income. For race/ethnicity, the three groups were (1) white, (2) African-American and Hispanic/Chicano, and (3) Asian. For household income, the groups were (1) $200,000 and more, (2) $100,000 to $200,000, and (3) below $100,000. Campus was more strongly associated with satisfaction with value received for price paid (7% variance explained) and there were four clusters. Without knowing campus identities, this information was of course of less use to the reader, but it can be said that most UC campuses grouped together and that one UC campus stood out at the low end.

It was previously determined that the household income of students' families was associated with a variety of student experiences and perceptions but that there were very few behaviors associated with academic experience and none particularly alarming. In fact, the most important finding was probably that differences in student experiences by household income for students from households below $100,000 were surprisingly unimportant -- it was asserted that financial aid programs had ameliorated differences below $100,000. It was also true that students from households with incomes above $100,000 were more satisfied, less impacted by economic factors, and less likely to be first-generation immigrants. The fact that wealth mattered in an enterprise with price tags was not too surprising. It was more surprising that the effects were so limited. The next analysis examined other demographic variables, income, and factor scores as a proxy for educational experience.

Table 7 presents the results of analysis of variance using first-generation U.S. immigrants as a bivariate variable and the ethnic, campus, and income groups identified in Table 6. The dependent variable in every case was a factor score. The pervasive lack of important differences was again remarkable. There were three factors and five sub-factors where knowledge of first-generation U.S., campus, race/ethnicity, and income made a substantive difference in explaining variance in factor scores:

- Satisfaction with educational experience overall
- Quality of instruction and courses in the major
- Satisfaction with access and availability of courses in the major
- Sense of belonging and satisfaction
- Current skills self-assessment (non-quantitative)
- Critical thinking and communication

- Engagement with studies
- Academic involvement and initiative

Table 6: Clusters of Equivalent Groups Based on Satisfaction with Value of Education (Weighted Sample of Dependent Undergraduates)

R Sqr Simple Model ANOVA (Weighted Sample)	Levels	Means	Gray Bars Show Groups With No Significant Difference (0.0001)	Clusters
0.07	Campus		a b c d e f g h i j k l m n	
	a) AAU Partner	4.7		
	b) AAU Partner	4.5		
	c) AAU Partner	4.3		
	d) AAU Partner	4.3		
	e) UC	4.2		
	f) AAU Partner	4.1		
	g) UC	3.9		
	h) AAU Partner	3.9		
	i) UC	3.8		
	j) UC	3.8		
	k) UC	3.7		
	l) UC	3.7		
	m) UC	3.6		
	n) UC	3.3		
0.00	Gender		a b	Drop
	a) Male	4.0		
	b) Female	4.0		
0.02	Race/Ethnicity		a b c d	
	a) White	4.2		
	b) African_American	4.0		
	c) Chicano	4.0		
	d) Asian	3.7		
0.00	Class Level		a b c d	
	a) Senior	4.1		Drop
	b) Sophomore	3.9		
	c) Junior	3.9		
	d) Freshman	3.9		
0.02	Household Income (Dependents)		a b c d e f g h i j k	
	a) Less than 10,000	3.7		
	b) 10,000 to 19,999	3.8		
	c) 20,000 to 34,999	3.8		
	d) 35,000 to 49,999	3.9		
	e) 50,000 to 64,999	3.9		
	f) 65,000 to 79,999	3.9		
	g) 80,000 to 99,999	3.9		
	h) 100,000 to 124,999	4.1		
	i) 125,000 to 149,999	4.2		
	j) 150,000 to 199,999	4.2		
	k) 200,000 or more	4.4		
0.00	Area of Major		a b c d e f g	
	a) Business	4.2		Drop
	b) Engineering	4.0		
	c) Math & Computer Science	3.9		
	d) Lib Arts & Soc Science	3.9		
	e) Agriculture & Architecture	3.8		
	f) Biology & Physical Sci	3.8		
	g) Area & Ethnic Studies	3.7		

When the independent contributions of first-generation U.S., ethnic, campus and income groups were considered, there were four independent relationships that explained at least five percent of variance in factor scores. Three of these relationships were with ethnic group and one was campus group. There was not an instance where income group was an important factor. To confirm that household income was an unimportant factor when viewing educational experience through comprehensive factors, the analysis was repeated using the eleven original household income groups.

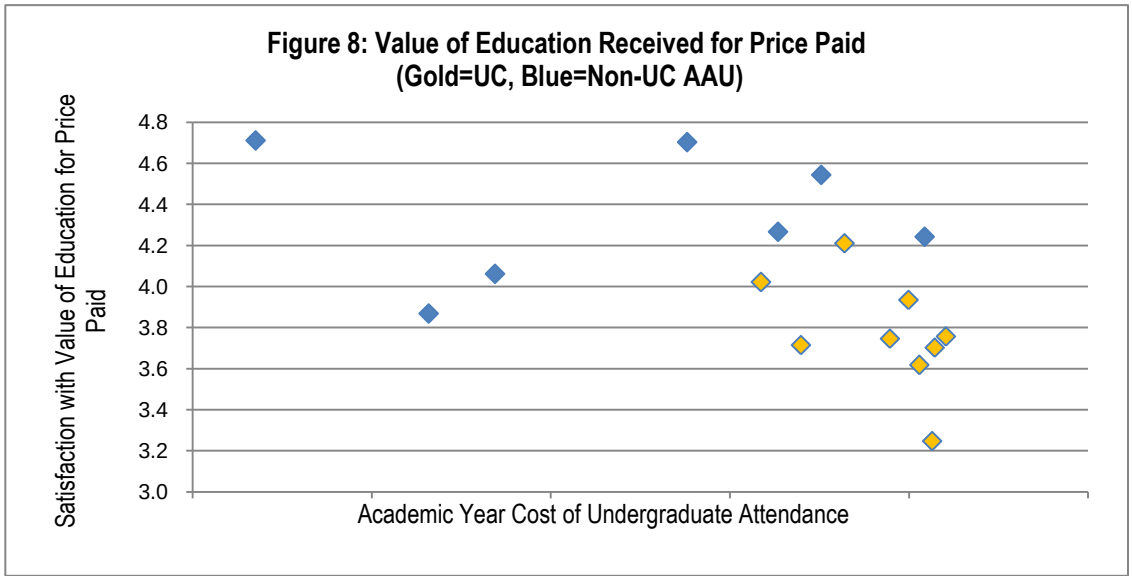
The results were remarkable. There was not a single case where household income explained even five percent of variance in a factor score – not even a weak relationship.

Table 7: Variance Explained (R-Square) of ANOVA using Ethnic, Campus, 1st Generation Immigrant, and Income Groups Value and Home Income

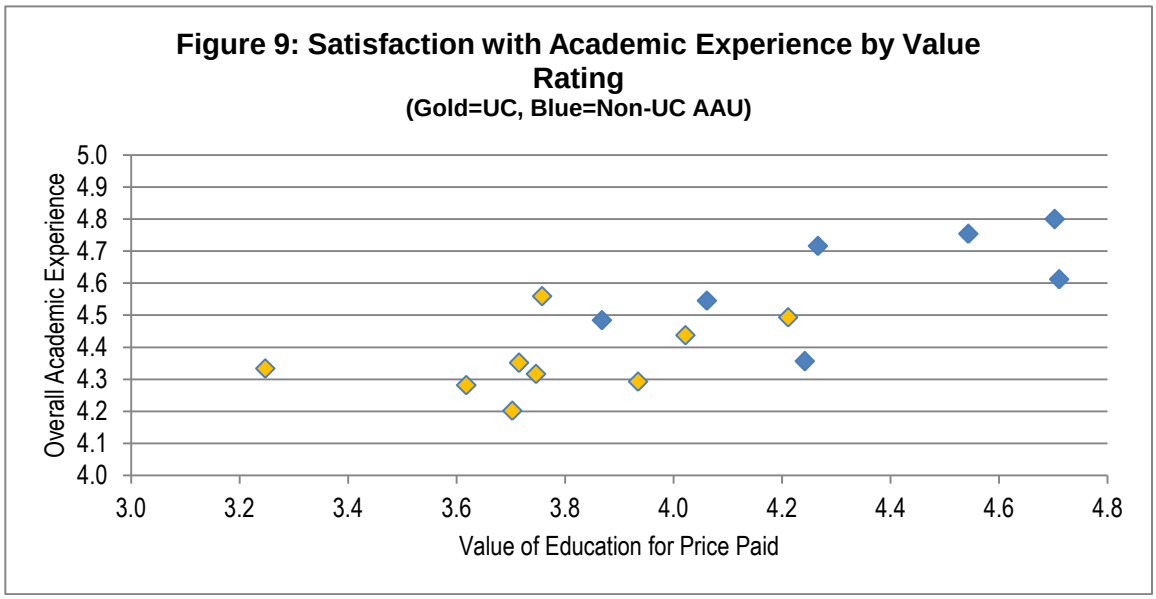
		Ethnic, Campus, Income Groups				
	Ethnic, Campus, 1st Generation US, Income Groups	Ethnic Group	Campus Group	1st Generation US	Income Group	Household Income (11 levels)
Factor 1: Satisfaction with Educational Experience	**0.09**	0.03	0.03	0.02	0.01	0.01
Subfactor 1a: Quality of Instruction and Courses in the Major	**0.06**	0.03	0.01	0.02	0.00	0.01
Subfactor 1b: Satisfaction with Access and Availability of Courses in the Major	**0.08**	0.02	0.03	0.02	0.00	0.01
Subfactor 1c: Sense of Belonging and Satisfaction	**0.15**	**0.05**	**0.05**	0.04	0.02	0.02
Subfactor 1d: Satisfaction with Advising and Out of Class Contact	0.03					0.00
Subfactor 1e: Clarity of Program Requirements, Policies & Practices	0.01					0.00
Subfactor 1f: Satisfaction with Library Support	0.03					0.00
Factor 2: Current Skills Self-Assessment (Nonquantitative)	**0.05**	0.02	0.01	0.01	0.01	0.01
Subfactor 2a: Critical Thinking and Communication	**0.12**	**0.06**	0.01	0.04	0.02	0.03
Subfactor 2b: Cultural Appreciation and Social Awareness	0.02					0.00
Subfactor 2c: Computer and Research Skills	0.01					0.00
Factor 3: Engagement with Studies	**0.05**	0.02	0.01	0.00	0.01	0.01
F3a: Academic Involvement and Initiative	**0.10**	**0.05**	0.02	0.01	0.01	0.01
F3b: Research or Creative Projects Experience	0.00					0.00
F3c: Collaborative Work	0.00					0.00
Factor 4: Gains in Self-Assessment of Skills (Nonquantitative)	0.01					0.00
Subfactor 4a: Gains in Critical Thinking and Communication	0.01					0.00
Subfactor 4b: Gains in Cultural Appreciation and Social Awareness	0.01					0.00
Subfactor 4c: Gains in Computer and Research Skills	0.01					0.00
Factor 5: Development of Scholarship	0.00					0.00
Subfactor 5a: Critical Reasoning and Assessment of Reasoning	0.00					0.00
Subfactor 5b: Curricular Foundations for Reasoning	0.00					0.00
Subfactor 5c: Elevated Academic Effort	0.00					0.00
Factor 6: Campus Climate for Diversity	0.02					0.00
Subfactor 6a: Climate for Personal Characteristics	0.02					0.01
Subfactor 6b: Freedom to Express Beliefs	0.02					0.00
Subfactor 6c: Climate of Respect for Personal Beliefs	0.01					0.00
Factor 7: Academic Disengagement (Inverted Scale)	0.01					0.01
Subfactor 7a: Extracurricular Engagement (Inverted Scale)	0.02					0.01
Subfactor 7b: Poor Academic Habits (Inverted Scale)	0.01					0.00
Subfactor 7c: Non-academic Motivations (Inverted Scale)	0.02					0.00
Factor 8: Quantitative Professions	0.02					0.00
Subfactor 8a: Career Orientation	0.03					0.00
Subfactor 8b: Quantitative Skills	0.00					0.00
Factor T: Use of Time (Academic and Employment)	0.02					0.01
Subfactor Ta: Time Employed	0.02					0.01
Subfactor Tb: Academic Time	0.02					0.00

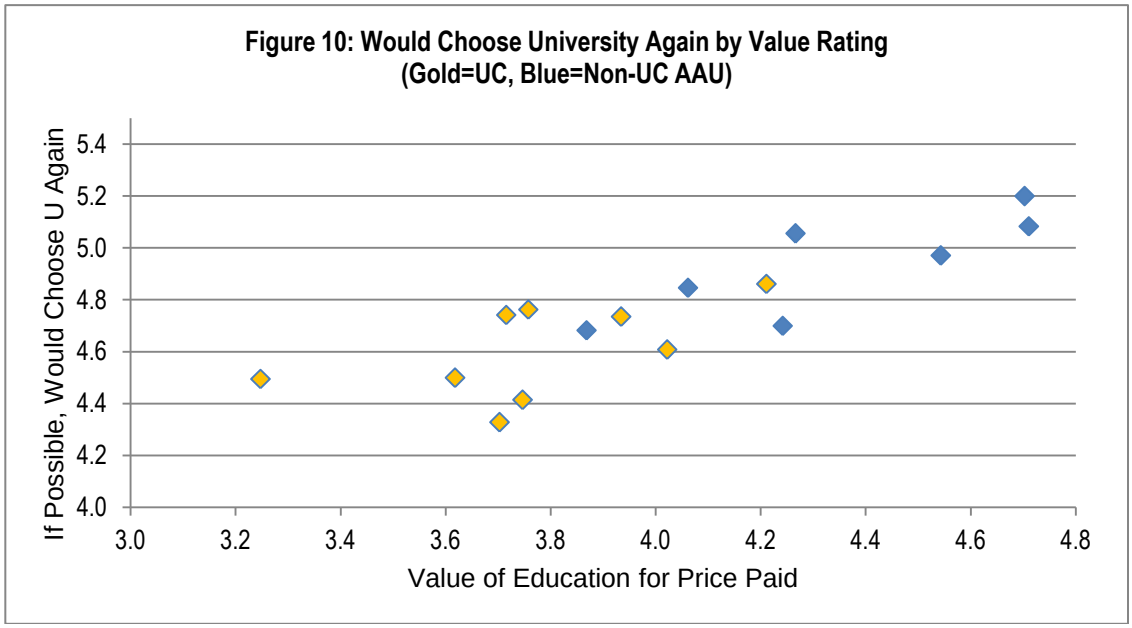
The final series of graphs examined differences in perceived value of education received for price paid and continued to emphasize campus differences. Because campus differences were the subject of these displays, the analysis returned to the original unweighted group of dependent respondents instead of the distribution weighted to better reflect public higher education at major research universities overall. It was reported earlier in this paper that satisfaction with value of education for price paid and other global satisfaction ratings were positively related for higher income students and negatively related to number of cost saving behaviors. The final three charts displayed value by academic year cost to attend (Figure 8), satisfaction with academic experience by value (Figure 9) and satisfaction with decision to enroll by value (Figure 10).

The most noteworthy observation about Figure 8 is that there was no simple relationship between cost to attend and perceived value for price paid. In addition, it was clear that the University of California campuses were rated similarly – were a group – with one exception. Students at one UC campus rated the value of the education received lower – an interesting result given that cost of attendance at all UCs is very comparable. Overall, and based only on student ratings, the best values were not UC campuses.



If perceived value was not clearly related to sticker-price, with what did it correlate? Figures 9 and 10 show that perceived value was clearly correlated with global satisfaction ratings: overall academic experience (Figure 9) and satisfaction with matriculation decision made (Figure 10). It was similarly clear that the global satisfaction measures were nearly redundant – the reader might at first think that the data in Figures 9 and 10 were the same. Factor analyses conducted over the history of the project confirm that there is a very strong latent satisfaction construct that results in very high correlations among global satisfaction scores. Value of education for price paid appears to be another global satisfaction measure and it was not clearly associated with sticker price. And last, when comparing UC and non-UC AAU institutions, the displays showed limited overlap. The non-UC AAU institutions were rated higher. It is important to note that these are subjective, independent assessments by students against some subjective norm. The ratings did not offer side-by-side institutional comparisons.[ix]





Conclusion

As the importance of a college degree is increasing, the combination of declining middle-class discretionary income and declining state support for higher education has exacerbated the impact of rapidly increasing higher education costs. There is *prima facie* evidence to consider whether the cost of attendance differentially impacts students from families with incomes above the threshold for governmental or institutional subsidies and grants but below the level where cost of attendance presents no hardship. Are middleclass students being squeezed in a way that negatively affects the undergraduate experience?

The results of this study are clear. Patterns of responses by students to the 2010 Student Experience at the Research University (SERU) survey of undergraduates at large public research universities found no U-shaped distributions where middleclass students were impacted more than both poorer and wealthier students. The patterns were flat or monotonic (always going up or always going down even if the slope changes). To illustrate, students from families at all income levels have been impacted by the rising cost to attend. However, financial aid programs have ameliorated the differences in experience for children from families with annual incomes below about $100,000 and students from families with higher incomes, especially incomes above $200,000, have a better experience overall (e.g., more satisfied, more likely to participate in enriching activities, less likely to worry about family or personal debt). This does not mean that middleclass families are not being squeezed. They very likely are being differentially impacted, but the differential impact has not extended to the undergraduate experience of the children.

There is reason to expect that the current situation will become worse before it improves. Will the remarkably successful financial aid programs that have leveled the university experience of students from poor and working class families continue to be adequately funded to meet ever-increasing costs in a budget cutting environment? Will the real and perceived value of higher education erode in an environment of few employment opportunities? Will the higher education experience degrade for all undergraduates as universities cut program budgets? It is critically important that the undergraduate experience be regularly examined during these difficult times and the SERU project is a good example of an opportunity to track changing perceptions and experiences in a comprehensive and comparative way.

ENDNOTES

[i] Participating UC campuses included those at Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, Santa Barbara, and Santa Cruz. Non-UC AAU institutions participating in 2010 were Rutgers University, University of Michigan, University of Minnesota, University of Oregon, University of Pittsburgh, and University of Texas. In one set of comparisons, University of Florida data from 2011 was used in addition to the 2010 data.

[ii] Annual Report of the White House Task Force on the Middle Class (February 2010). Vice President Joe Biden Chair

[iii] Harvard professor, Assistant to the President and Special Advisor to the Secretary of the Treasury on the Consumer Financial Protection Bureau, and chair of the Congressional Oversight Panel that is monitoring the TARP bailout funds given to banks.

[iv] The SERU/UCUES Questionnaire is a comprehensive instrument with common and randomly assigned modules that is administered in census fashion – to all undergraduate students enrolled.

[v] The undergraduate population was over 300,000 and responses were received from over 130,000 students. The weighted simple random sample was proportional to undergraduate enrollment of the institutions and was over 40,000 students in total. Only the responses of financially dependent students were considered. Response counts to individual items varied but were large. For example, response counts to the items being discussed here were over 30,000.

[vi] Spring 2011 Textbook Cost Survey, released August 11, 2011, MakeTextBooksAffordable.org.

[vii] Chi Square statistic with Cramer's V for strength of association

[viii] Chatman, S.P. (2009). Factor structure and reliability of the 2008 and 2009 SERU/UCUES questionnaire core. *CSHE Technical Report*, Berkeley, CA.

[ix] Includes a non-UC AAU campus from 2011 that did not participate in the 2010 administration but had a sufficiently large percentage of responses in 2011 at the time this was written.